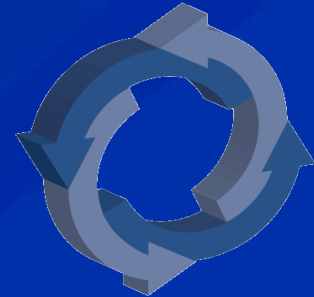


# Countermeasure and Response Administration



## Monitoring Influenza A (H1N1) Vaccine Doses Administered Using CDC's Countermeasure and Response Administration System: Lessons Learned

2010 National Immunization Conference  
Atlanta, GA

Joint Presentation April 22, 2010 by:

Immunization Services Division

National Center for Immunization and Respiratory Diseases  
and

Division of Informatics Solutions and Operations (proposed)

Public Health Informatics and Technology Program Office (proposed)



# CRA Objectives



- Background
- Present Results from 2009 H1N1 Vaccine Doses Administered Event
- Share Lessons Learned and Best Practices

# Why Doses Administered?



- “Gold standard” statistical methods (BRFSS, NIS) to assess vaccine coverage are used during a normal influenza season when vaccine volume is high
- In the early stages of the H1N1 campaign, vaccine volume was not high enough for these to be statistically significant until approximately week 8
- Doses administered (DA) data – in combination with distribution figures – were used to assess coverage and help assure the vaccine was reaching targeted groups during those initial 8 weeks
- DA data also provided a “check and balance” for identifying vaccine distribution or implementation issues

# Countermeasure and Response Administration (CRA)



- Genesis in Pre-Event Vaccination System (PVS) for national smallpox vaccination campaign
- Supports mass tracking during an event
  - Tracks both detail (person level) and aggregate counts of countermeasures
- Evolved to support any countermeasure, any event
  - Medical interventions (vaccines, pharmaceuticals)
  - Non-medical interventions (patient isolation, quarantine, scarce medical equipment and social distancing measures)
- CRA was updated and exercised in 2007/8 and 2008/9 to support doses administered for pandemic influenza
- CRA was stood up to track and monitor H1N1 Doses Administered for the initial weeks of the H1N1 Vaccine Program

# Aggregate Reporting Options via CRA



**2009 H1N1 Response**

**26 Option 1 Users**



State enter data into state's Immunization Information System or other equivalent application and is extracted in one of these formats:

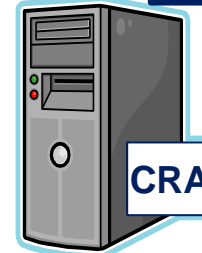
**Option 1  
Data exchange**

Pipe-delimited File

XML File

HL 7

File is securely transferred to CDC via either CRA application or PHIN MS and loaded into CRA for reporting



Aggregate data entered directly into CRA via the web-based aggregate reporting interface

**Option 2  
Direct web entry**

Age Group	Count
0-4	1
5-9	1
10-14	1
15-19	1
20-24	1
25-29	1
30-34	1
35-39	1
40-44	1
45-49	1
50-54	1
55-59	1
60-64	1
65-69	1
70-74	1
75-79	1
80-84	1
85-89	1
90-94	1
95-99	1
Total	25

Data is available in CRA for reporting



**35 Option 2 Users**



Individual level data is entered directly into CRA via the web based flexible Treatment interface

**Option 3  
Individual level  
data entry**

Patient Name	Date of Birth	Sex
John Doe	12/12/1980	M
Jane Smith	03/03/1985	F
Bob Johnson	07/07/1990	M
Alice Brown	11/11/1995	F
Charlie Davis	05/05/2000	M
Eve Miller	09/09/2005	F
Frank Wilson	01/01/2010	M
Grace Moore	04/04/2015	F
Henry Taylor	06/06/2020	M
Ivy Anderson	08/08/2025	F
Jack Thomas	10/10/2030	M
Karen White	12/12/2035	F
Leo Green	02/02/2040	M
Mia Black	04/04/2045	F
Noah Gray	06/06/2050	M
Olivia Pink	08/08/2055	F
Peter Blue	10/10/2060	M
Quinn Yellow	12/12/2065	F
Sam Red	01/01/2070	M
Tina Purple	03/03/2075	F
Uma Green	05/05/2080	M
Victor Blue	07/07/2085	F
Wendy Yellow	09/09/2090	M
Xavier Red	11/11/2095	F
Yara Purple	13/13/2100	M
Zoe Green	15/15/2105	F
Adam Black	17/17/2110	M
Bella White	19/19/2115	F
Carl Gray	21/21/2120	M
Diana Pink	23/23/2125	F
Ethan Blue	25/25/2130	M
Fiona Yellow	27/27/2135	F
Gavin Red	29/29/2140	M
Helen Purple	31/31/2145	F
Ian Green	33/33/2150	M
Jane Black	35/35/2155	F
Kevin White	37/37/2160	M
Laura Gray	39/39/2165	F
Mark Pink	41/41/2170	M
Nancy Blue	43/43/2175	F
Oscar Yellow	45/45/2180	M
Pamela Red	47/47/2185	F
Quinn Purple	49/49/2190	M
Rachel Green	51/51/2195	F
Samuel Black	53/53/2200	M
Tina White	55/55/2205	F
Uma Gray	57/57/2210	M
Victor Pink	59/59/2215	F
Wendy Blue	61/61/2220	M
Xavier Yellow	63/63/2225	F
Yara Red	65/65/2230	M
Zoe Purple	67/67/2235	F
Adam Green	69/69/2240	M
Bella Black	71/71/2245	F
Carl White	73/73/2250	M
Diana Gray	75/75/2255	F
Ethan Pink	77/77/2260	M
Fiona Blue	79/79/2265	F
Gavin Yellow	81/81/2270	M
Helen Red	83/83/2275	F
Ian Purple	85/85/2280	M
Jane Green	87/87/2285	F
Kevin Black	89/89/2290	M
Laura White	91/91/2295	F
Mark Gray	93/93/2300	M
Nancy Pink	95/95/2305	F
Oscar Blue	97/97/2310	M
Pamela Yellow	99/99/2315	F
Quinn Red	101/101/2320	M
Rachel Purple	103/103/2325	F
Samuel Green	105/105/2330	M
Tina Black	107/107/2335	F
Uma White	109/109/2340	M
Victor Gray	111/111/2345	F
Wendy Pink	113/113/2350	M
Xavier Blue	115/115/2355	F
Yara Yellow	117/117/2360	M
Zoe Red	119/119/2365	F
Adam Purple	121/121/2370	M
Bella Green	123/123/2375	F
Carl Black	125/125/2380	M
Diana White	127/127/2385	F
Ethan Gray	129/129/2390	M
Fiona Pink	131/131/2395	F
Gavin Blue	133/133/2400	M
Helen Yellow	135/135/2405	F
Ian Red	137/137/2410	M
Jane Purple	139/139/2415	F
Kevin Green	141/141/2420	M
Laura Black	143/143/2425	F
Mark White	145/145/2430	M
Nancy Gray	147/147/2435	F
Oscar Pink	149/149/2440	M
Pamela Blue	151/151/2445	F
Quinn Yellow	153/153/2450	M
Rachel Red	155/155/2455	F
Samuel Purple	157/157/2460	M
Tina Green	159/159/2465	F
Uma Black	161/161/2470	M
Victor White	163/163/2475	F
Wendy Gray	165/165/2480	M
Xavier Pink	167/167/2485	F
Yara Blue	169/169/2490	M
Zoe Yellow	171/171/2495	F
Adam Red	173/173/2500	M
Bella Purple	175/175/2505	F
Carl Green	177/177/2510	M
Diana Black	179/179/2515	F
Ethan White	181/181/2520	M
Fiona Gray	183/183/2525	F
Gavin Pink	185/185/2530	M
Helen Blue	187/187/2535	F
Ian Yellow	189/189/2540	M
Jane Red	191/191/2545	F
Kevin Purple	193/193/2550	M
Laura Green	195/195/2555	F
Mark Black	197/197/2560	M
Nancy White	199/199/2565	F
Oscar Gray	201/201/2570	M
Pamela Pink	203/203/2575	F
Quinn Blue	205/205/2580	M
Rachel Yellow	207/207/2585	F
Samuel Red	209/209/2590	M
Tina Purple	211/211/2595	F
Uma Green	213/213/2600	M
Victor Black	215/215/2605	F
Wendy White	217/217/2610	M
Xavier Gray	219/219/2615	F
Yara Pink	221/221/2620	M
Zoe Blue	223/223/2625	F
Adam Yellow	225/225/2630	M
Bella Red	227/227/2635	F
Carl Purple	229/229/2640	M
Diana Green	231/231/2645	F
Ethan Black	233/233/2650	M
Fiona White	235/235/2655	F
Gavin Gray	237/237/2660	M
Helen Pink	239/239/2665	F
Ian Blue	241/241/2670	M
Jane Yellow	243/243/2675	F
Kevin Red	245/245/2680	M
Laura Purple	247/247/2685	F
Mark Green	249/249/2690	M
Nancy Black	251/251/2695	F
Oscar White	253/253/2700	M
Pamela Gray	255/255/2705	F
Quinn Pink	257/257/2710	M
Rachel Blue	259/259/2715	F
Samuel Yellow	261/261/2720	M
Tina Red	263/263/2725	F
Uma Purple	265/265/2730	M
Victor Green	267/267/2735	F
Wendy Black	269/269/2740	M
Xavier White	271/271/2745	F
Yara Gray	273/273/2750	M
Zoe Pink	275/275/2755	F
Adam Blue	277/277/2760	M
Bella Yellow	279/279/2765	F
Carl Red	281/281/2770	M
Diana Purple	283/283/2775	F
Ethan Green	285/285/2780	M
Fiona Black	287/287/2785	F
Gavin White	289/289/2790	M
Helen Gray	291/291/2795	F
Ian Pink	293/293/2800	M
Jane Blue	295/295/2805	F
Kevin Yellow	297/297/2810	M
Laura Red	299/299/2815	F
Mark Purple	301/301/2820	M
Nancy Green	303/303/2825	F
Oscar Black	305/305/2830	M
Pamela White	307/307/2835	F
Quinn Gray	309/309/2840	M
Rachel Pink	311/311/2845	F
Samuel Blue	313/313/2850	M
Tina Yellow	315/315/2855	F
Uma Red	317/317/2860	M
Victor Purple	319/319/2865	F
Wendy Green	321/321/2870	M
Xavier Black	323/323/2875	F
Yara White	325/325/2880	M
Zoe Gray	327/327/2885	F
Adam Pink	329/329/2890	M
Bella Blue	331/331/2895	F
Carl Yellow	333/333/2900	M
Diana Red	335/335/2905	F
Ethan Purple	337/337/2910	M
Fiona Green	339/339/2915	F
Gavin Black	341/341/2920	M
Helen White	343/343/2925	F
Ian Gray	345/345/2930	M
Jane Pink	347/347/2935	F
Kevin Blue	349/349/2940	M
Laura Yellow	351/351/2945	F
Mark Red	353/353/2950	M
Nancy Purple	355/355/2955	F
Oscar Green	357/357/2960	M
Pamela Black	359/359/2965	F
Quinn White	361/361/2970	M
Rachel Gray	363/363/2975	F
Samuel Pink	365/365/2980	M
Tina Blue	367/367/2985	F
Uma Yellow	369/369/2990	M
Victor Red	371/371/2995	F
Wendy Purple	373/373/3000	M
Xavier Green	375/375/3005	F
Yara Black	377/377/3010	M
Zoe White	379/379/3015	F
Adam Gray	381/381/3020	M
Bella Pink	383/383/3025	F
Carl Blue	385/385/3030	M
Diana Yellow	387/387/3035	F
Ethan Red	389/389/3040	M
Fiona Purple	391/391/3045	F
Gavin Green	393/393/3050	M
Helen Black	395/395/3055	F
Ian White	397/397/3060	M
Jane Gray	399/399/3065	F
Kevin Pink	401/401/3070	M
Laura Blue	403/403/3075	F
Mark Yellow	405/405/3080	M
Nancy Red	407/407/3085	F
Oscar Purple	409/409/3090	M
Pamela Green	411/411/3095	F
Quinn Black	413/413/3100	M
Rachel White	415/415/3105	F
Samuel Gray	417/417/3110	M
Tina Pink	419/419/3115	F
Uma Blue	421/421/3120	M
Victor Yellow	423/423/3125	F
Wendy Red	425/425/3130	M
Xavier Purple	427/427/3135	F
Yara Green	429/429/3140	M
Zoe Black	431/431/3145	F
Adam White	433/433/3150	M
Bella Gray	435/435/3155	F
Carl Pink	437/437/3160	M
Diana Blue	439/439/3165	F
Ethan Yellow	441/441/3170	M
Fiona Red	443/443/3175	F
Gavin Purple	445/445/3180	M
Helen Green	447/447/3185	F
Ian Black	449/449/3190	M
Jane White	451/451/3195	F
Kevin Gray	453/453/3200	M
Laura Pink	455/455/3205	F
Mark Blue	457/457/3210	M
Nancy Yellow	459/459/3215	F
Oscar Red	461/461/3220	M
Pamela Purple	463/463/3225	F
Quinn Green	465/465/3230	M
Rachel Black	467/467/3235	F
Samuel White	469/469/3240	M
Tina Gray	471/471/3245	F
Uma Pink	473/473/3250	M
Victor Blue	475/475/3255	F
Wendy Yellow	477/477/3260	M
Xavier Red	479/479/3265	F
Yara Purple	481/481/3270	M
Zoe Green	483/483/3275	F
Adam Black	485/485/3280	M
Bella White	487/487/3285	F
Carl Gray	489/489/3290	M
Diana Pink	491/491/3295	F
Ethan Blue	493/493/3300	M
Fiona Yellow	495/495/3305	F
Gavin Red	497/497/3310	M
Helen Purple	499/499/3315	F
Ian Green	501/501/3320	M
Jane Black	503/503/3325	F
Kevin White	505/505/3330	M
Laura Gray	507/507/3335	F
Mark Pink	509/509/3340	M
Nancy Blue	511/511/3345	F
Oscar Yellow	513/513/3350	M
Pamela Red		

# Guidelines for H1N1 Doses Administered Reporting



- Each Project Area responsible for
  - Sending data to CRA for each reporting period
  - Aggregating all doses administered by age group and dose number for all clinics in the jurisdiction
- Reporting based on the MMWR week
  - Sunday – Saturday
- Reporting required weekly to CDC by Tuesday 11:59 pm of respective time zone





# H1N1 Vaccine Doses Administered

## Data Summary Results



- 8 week reporting period 10/03 – 11/21
  - Updates allowed through 12/31/2009
- Total doses administered: **14,788,795**
  - For reporting period 10/03 – 11/21 as of 1/1/10
- Project Area reporting status
  - **35%** doses administered reported/doses shipped
  - Children ages 5-18 received more than **35%** of the reported H1N1 vaccine
  - Over **83%** of the vaccine reported was for persons under 65 years
- Average lag time was 2 – 4 weeks for receiving full updated counts

# H1N1 Vaccine Doses Administered

## Final Map



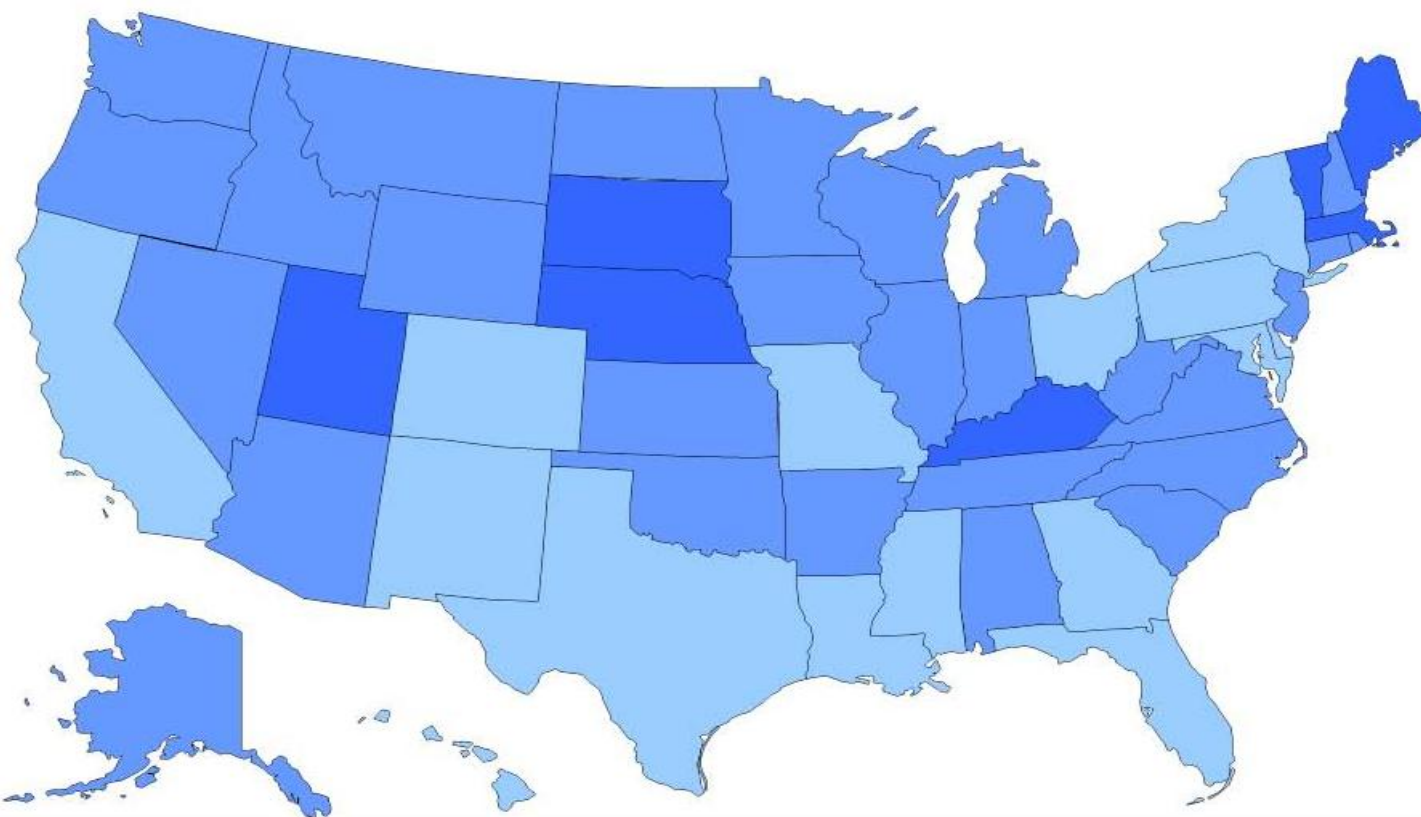
### Influenza A (H1N1) 2009 Monovalent Vaccine Confirmed Doses Administered Summary Report

Date Range: 11/15/2009 to 11/21/2009 (2009 MMWR 46)

Figure 3: National map

Total Doses Administered: 14,499,855

Data represents 1<sup>st</sup> dose



#### Percent of Population Vaccinated\*

- None Given
- 0.00 to 4.57%
- 4.58 to 9.15%
- 9.16 to 13.73%
- 13.74 to 18.33%

#### Metropolitan Areas

- Chicago, IL
- District of Columbia, DC
- Los Angeles, CA
- New York City, NY

#### Islands

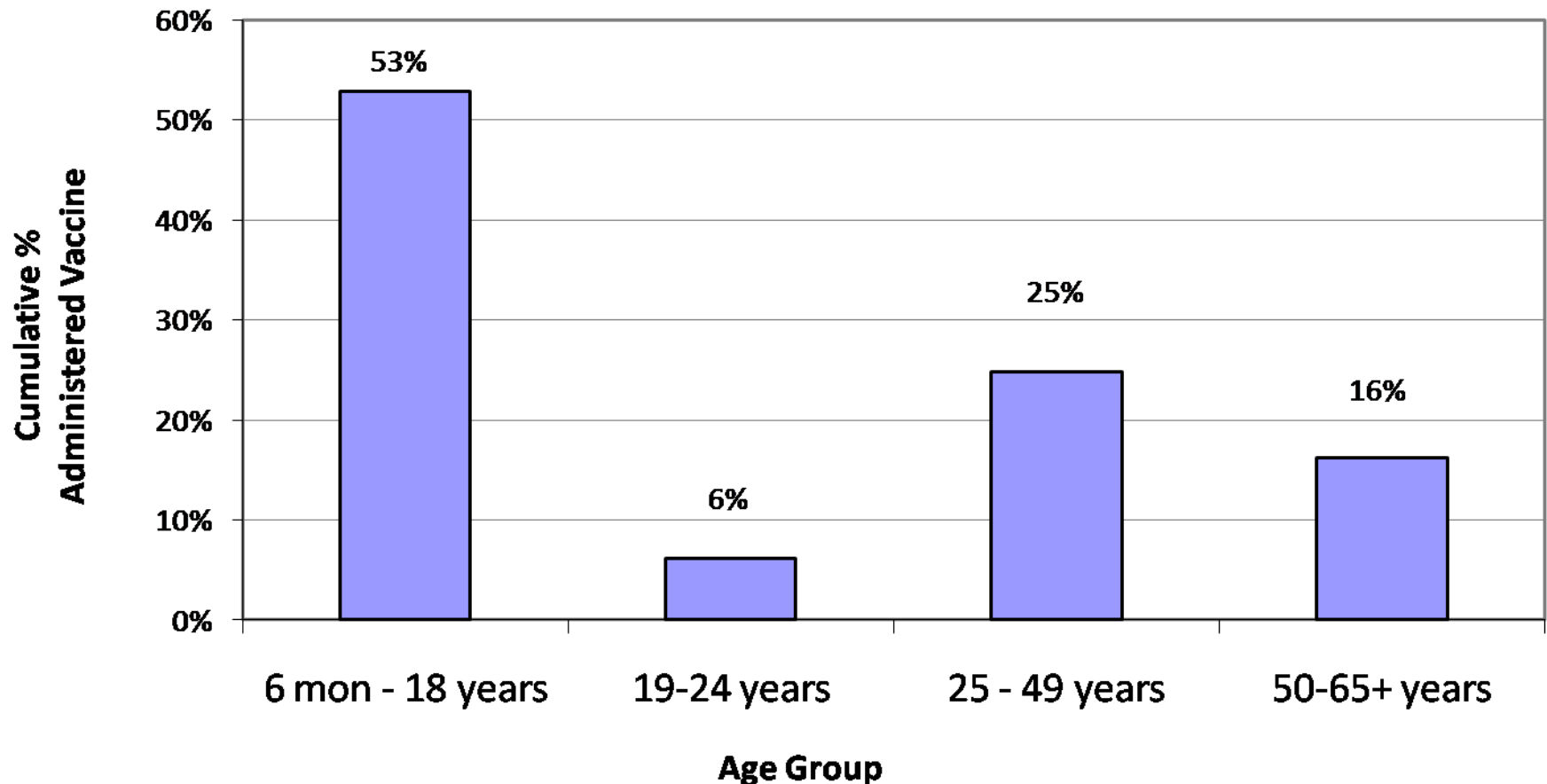
- American Samoa
- Guam
- Micronesia
- Marshall Islands
- Northern Mariana Islands
- Palau
- Puerto Rico
- Virgin Islands



# H1N1 Doses Administered By Age Group



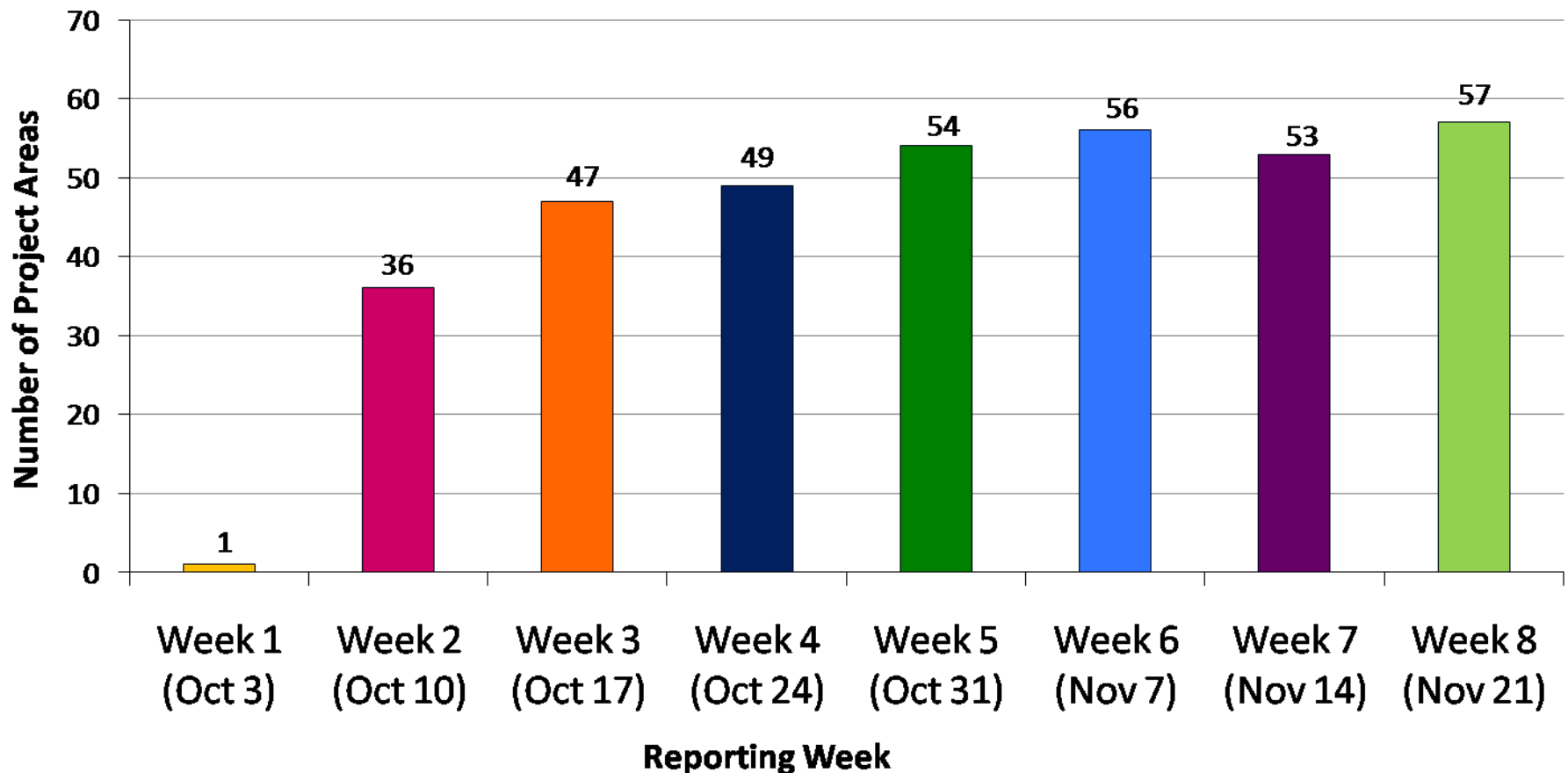
**Total Administered Doses by Age Group**



# Reporting Timeliness



**Timeliness:** Sending weekly aggregate data by 11:59 PM on Tuesday following the reporting week.



# Robust Project Areas (11/21/2009)

## National and Option Type Coverage

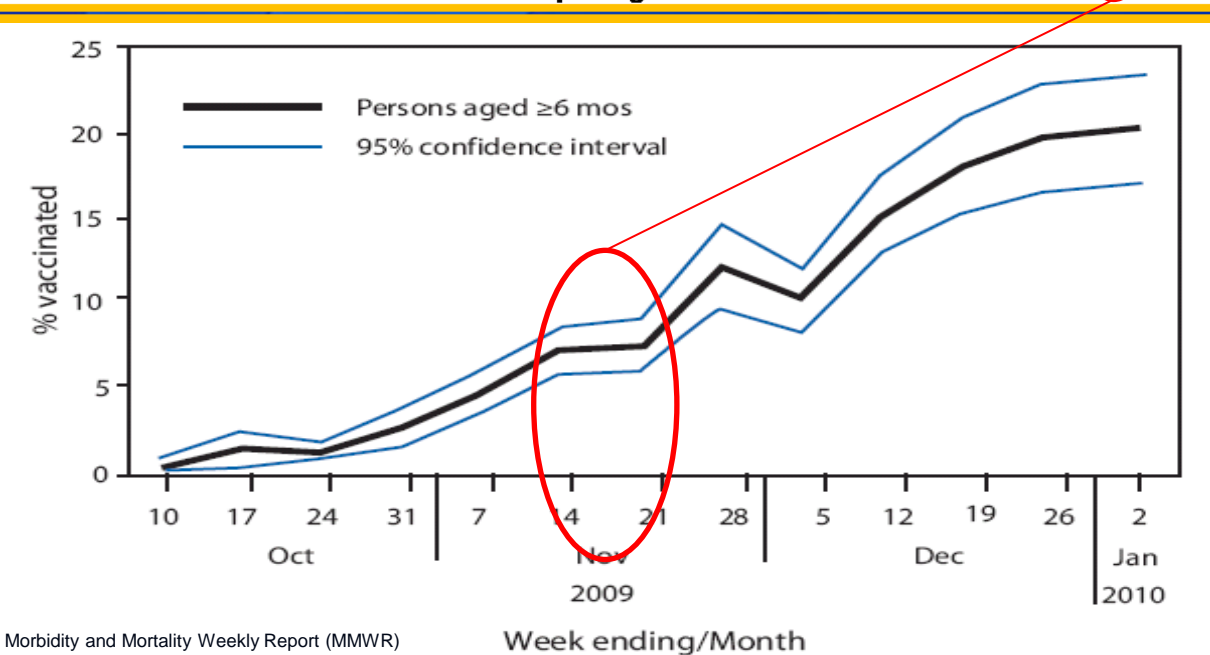
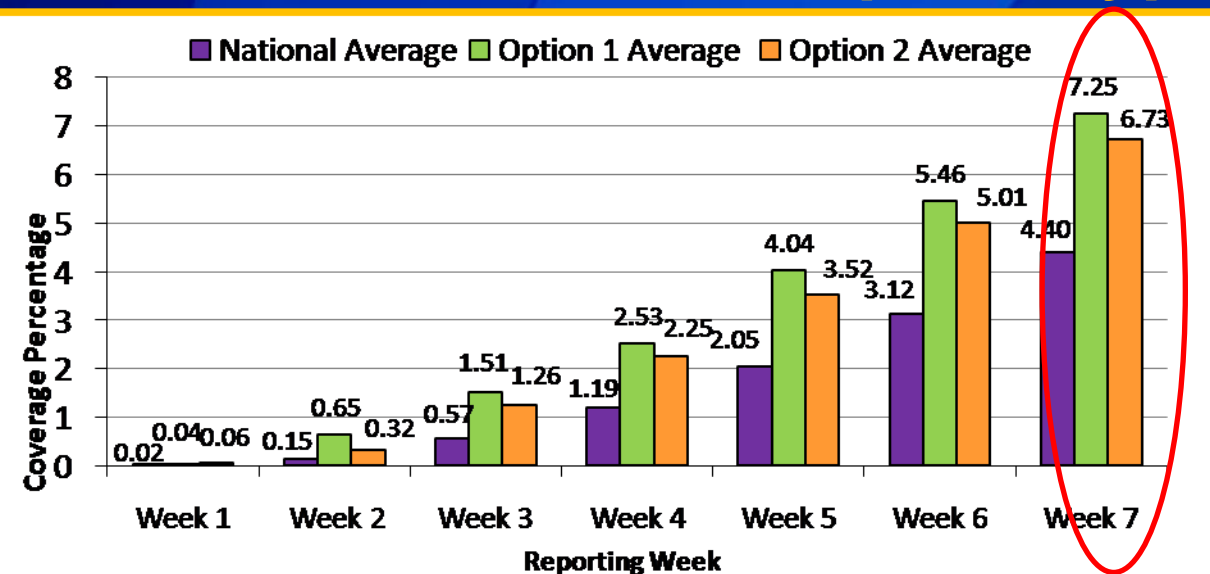


Figure 1. Robust coverage: weekly percentage of Option 1 & 2 users reporting higher than the national average

- CRA doses administered reporting, w/e 10/10/2009 through w/e 11/21/2009

Figure 2. Weekly estimates of vaccination coverage among U.S. residents aged  $\geq 6$  months

- National 2009 H1N1 Flu Survey, w/e 10/10/2009 through w/e 1/2/2010



# Data Transfer and Aggregation Methods



Option 1 Users	Count	Percentage
PIPE/CRA	9/26	35%
XML/CRA	8/26	31%
XML/PHIN MS	3/26	11%
Not Specified	6/26	23%

Option 2 Users*	Count	Percentage
IIS in combination w/other method	20/33	61%
Paper only	7/33	21%
Paper + website	3/33	9%
Other	2/33	6%
Paper + Survey	1/33	3%

\* H1N1 doses administered data for 2 Project Areas was not received during the 8-week reporting period



# Feedback Questionnaire Outcomes



- Project Areas were asked to complete an anonymous, on-line feedback questionnaire
- 85% (53/62) respondents completed the poll
- Eleven questions highlighting
  - Ease of using CRA to report data
  - Effectiveness of communication from CDC
  - Benefits of past exercises
  - Issues/barriers encountered
  - Collaboration between Immunization and Emergency Preparedness
  - Feedback to improve future responses





# Please rate your experience with the level of support provided by CDC?

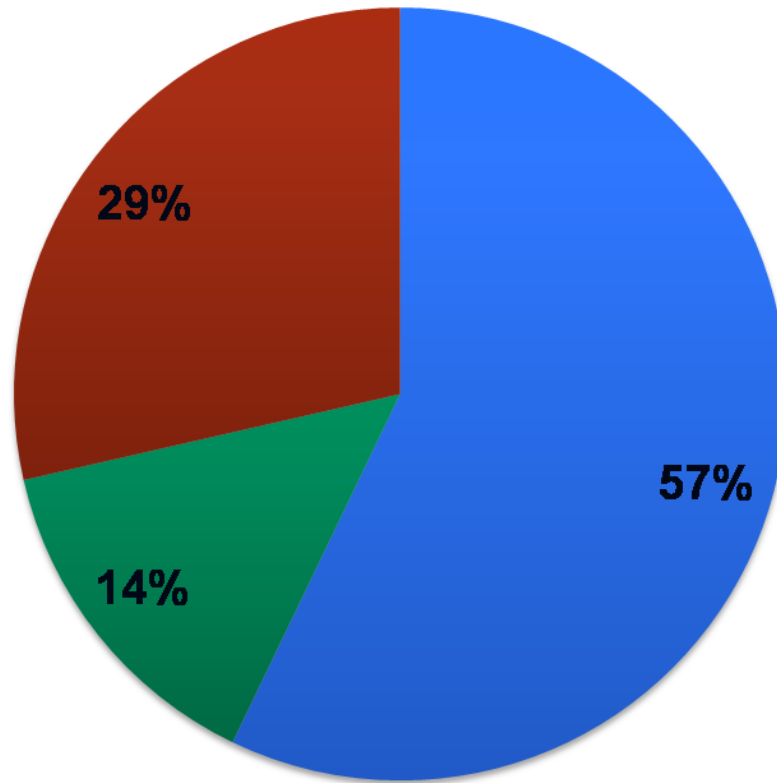
<b>Number of respondents=50</b>	<b>Very Adequate or Adequate</b>	<b>Neutral</b>	<b>Not Adequate or Very Inadequate</b>	<b>Not Applicable</b>
<b>Communication</b>	<b>92%</b>	<b>4%</b>	<b>4%</b>	<b>0%</b>
<b>CDC Points of Contact</b>	<b>90%</b>	<b>8%</b>	<b>2%</b>	<b>0%</b>
<b>Weekly Project Area Update</b>	<b>80%</b>	<b>12%</b>	<b>6%</b>	<b>2%</b>
<b>CRA Webpage</b>	<b>72%</b>	<b>10%</b>	<b>6%</b>	<b>12%</b>
<b>Technical Assistance and Support</b>	<b>68%</b>	<b>16%</b>	<b>2%</b>	<b>14%</b>
<b>PHIN Helpdesk</b>	<b>56%</b>	<b>20%</b>	<b>0%</b>	<b>24%</b>



# Has H1N1 Initiative helped to improve coordination and communication between Immunization and Preparedness branches/sections at your health department?

## All Options

■ Yes ■ No ■ Neutral



# After Action Review Call Feedback



- Challenges with DA exercise priority groups conforming to H1N1 ACIP age groups
- CRA was easy to use
- CDC/CRA support was good (technical and project)
- Communication was good throughout event
- Continue interactive webinars to show functionality of CRA



# Project Area Summary Reports



## Countermeasure and Response Administration



### CRA Novel Influenza (H1N1) 09 Event Summary: Great State



The purpose of this summary report is to illustrate how Project Areas performed in terms of timeliness, responsiveness, weekly data update performance measures set for the 2 Vaccine Program during the first 7 doses administration. Project Areas report doses administered to CDC application. The requirement to report doses administered aggregate count MAFWR week 46 (November 15 – report date of Tuesday, November 10, 2009). By November 21, 2009, 6 reported a total XXXX,XXX doses 2

Great State, with a population of 9, CRA's aggregate web entry (Option vaccine doses administered to CDC began reporting vaccine for week 4 10, 2009. By November 21, 2009, 6 reported a total XXXX,XXX doses 2

#### Key Definitions and Project Area

**Results Matrix**  
Seldom Met Requirement = 0  
Sometimes Met Requirement = 1  
Usually Met Requirement = 6  
Consistently Met Requirement = 7

**Timeliness** is defined as submitting aggregate data by 11:59 PM on Tuesday the reporting week.

**Results: Consistently Met R**

**Responsiveness** is defined as the a Project Area reported aggregate c application during the Novel Influenza Event.

**Results: Consistently Met R for 7 Consecutive W**

**Weekly Data Update** is defined as updating doses administered count reporting weeks on a weekly basis.

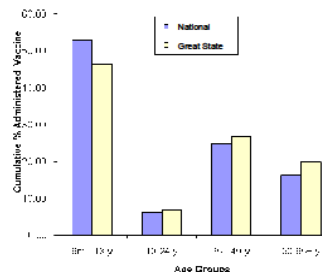
**Results: 3 out of 7 Report**

11/15

### CRA Novel Influenza (H1N1) 09 Event Summary: Great State



Figure 1. Great State's Vaccine Doses Reported by Different Age Groups Compared with the National Average



#### Lessons Learned and Conclusions:

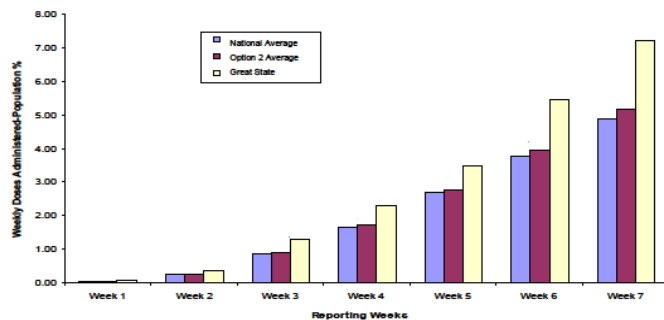
During pre-event assessment, Great State estimated 75% of state and local/county health departments were fully prepared and capable of reporting doses administered data. Great state was among the Project Areas who required reporting from providers prior to shipping them additional vaccine. This evidently contributed to the high ratio of doses reported (vs shipped) to CDC. The data submitted align with ACIP age groups as shown in Table 1 and Figure 1.

Analysis of the reported H1N1 doses administered data demonstrates that Great State *consistently met* the timeliness and responsiveness requirements, and also performed higher than the national average for 7 consecutive weeks as shown in Figure 2. Great State also demonstrated very efficient quality control measures in tracking doses administered in comparison to other Project Areas.

CRA sponsored 20 event planning and execution webinars and conference calls; Great State participated in 18 sessions which is considered *frequent attendance* (median was 11).

Great state participated in the both Pilot 2007 and DAX 2008 exercises and met the "fully successful" criteria for DAX 2008.

Figure 2. Weekly Variation of Great State's Doses Administered Compared with the National Average and Option 2 Project Areas\*



\* The national and jurisdictional population percentages are calculated using the cumulative doses administered total for the nation or the jurisdiction divided by the population for the area. The 2006 census estimates for the 50 states, District of Columbia, the U.S. territories and the metropolitan areas are utilized for population denominators. The U.S. territories included are American Samoa, Guam, Marshall Islands, Micronesia, Northern Mariana Islands, Palau, Puerto Rico and the Virgin Islands. The metropolitan area populations of Los Angeles, Chicago and New York City are subtracted out of the state populations of California, Illinois and New York respectively.

\*U.S. Census Bureau population estimates are based on 2006 census data and methodology developed by the U.S. Census Bureau. For more information, please visit: <http://www.census.gov/cr/cr.html> or e-mail us at [CRA@cdc.gov](mailto:CRA@cdc.gov)



- Illustrate how Project Areas performed according to key metrics
  - Timeliness
  - Responsiveness
  - Weekly Data Updates
- Comparisons with national figures and Project Areas using same reporting Option
- Charts/Graphs
- Lessons Learned and Conclusions



# Doses Administered Successes and Challenges



## Successes

- Nearly 100% weekly reporting from all Project Areas
- One of few data sources on how the vaccine campaign was progressing
- Data check for other H1N1 activities

## Challenges

- Relatively nascent data source
- Provider timeliness and reporting accuracy
- Operational logistics at the Project Area level
- Programmatic/Technical
  - Digital Certificates
  - SDN security upgrades
  - Aggregate reporting
  - Uploading information





# Lessons Learned



- Good thing we had a system and standard practices already set up and exercised as part of pandemic influenza preparedness !
- Difficult to get timely and complete reporting nation-wide given varying capabilities across states; in the future, may consider a subset of “robust project areas” until capabilities are consistently higher
- Room for improvement in system automation at state and local levels
- Increased communication frequency via webinars, conference calls and one-on-one calls improved participation over the exercises (also it was a pandemic!)
- Positive collaboration among federal, state and local health agencies contributed to the success of the H1N1 doses administered monitoring response
- Consistent and agreed upon processes needed between Immunization and Preparedness Programs

# Plans for 2010



- Continue to seek supplemental funding opportunities to assist Project Areas
- Continue to provide educational opportunities (i.e. conferences, meetings, etc.)
- Further evaluation of Project Area participation in exercises versus actual event
- Doses Administered hiatus through year end



# Questions or Comments?

